1. A rocket plume detector comprising,

B1

a) a passive electro-optical sensor for detecting narrow band spectral emissions in a rocket engine plume, including through clouds and

b) a lock-in amplifier to reduce background radiation for enhanced plume detection, said sensor being mounted on an above-flying or orbiting platform.

Remarks

Claims 1 -- 15 are in the present application.

Claim 1 has been amended as indicated above, to add the limitation of a lock-in amplifier to such claim, to screen out background radiation for greater accuracy in plume detection.

Support for such addition of a lock-in amplifier is found on page 5, beginning at line 6, which amplifier is also shown in Figure 1 as component 20 and no new matter has been added.

The Office Action rejection of claims 1 -- 9 and 11 -- 15 as obvious under 35 USC 103 (a) over Hill, Jr. et al ('285), in view of Hasson ('452), is respectively traversed. While these references disclose detecting spectral emissions in an engine plume, they don't do so through clouds. For example, Hassen, '452, in describing his Figure 3, at col. 5, lines 66 & 67 & col. 6, lines 1-3, speaks of detecting a launching plume beneath clouds by viewing radiation reflected from such clouds, to such aircraft 10, in a vague detection system. And Hill et al rely on stimulated emission at all times and cannot accurately or quickly, send a laser beam down through clouds (due to beam dissipation & reflection) to find a rocket plume and then read same back, e.g., by sensor 110 of Hill's Figure 3.

Further, while both references disclose spectral emissions from an engine plume, they do not suggest screening out background radiation (such as lamps at 60 Hertz) so as to focus on plume emissions at, e.g., 50 Hertz by employing a lock-in amplifier in their respective detector systems.

Applicants, per claim1, as amended, employ a plume detector which includes an electro-optical sensor for detecting narrow band spectral emissions and a lock-in amplifier, to reduce background radiation for more accurate detection of such plumes, through clouds, if present, in daylight as well as at night.

Accordingly, claim 1 and its dependent claims are believed distinguished over the above two references by applicants two-way or dual filtering plume detection system, compared with the one-way or spectral emissions plume detection by the above two references.

The Office Action rejection of claim 10, as obvious under the 35 USC 103 (a) over Hill et al, '285, in view of Hassen,' 452, and further in view of Houlberg,' 571, is respectively traversed. Claim 10 is believed distinguished over the applied references in view of its dependence from claim 1, as amended, for reasons discussed above.

Likewise, the remainder of the dependent claims, 2 – 15, are believed distinguished over the above applied references in view of their dependence from claim 1, as amended, which is believed novel thereover as discussed above.

In view of the foregoing the claims of record, as amended, are believed distinguished over the applied art and perhaps in condition for allowance.

In accordance with Section 714.01 of the M.P.E.P., the following information is presented in the event that a call may be deemed desirable by the Examiner: Thomas C. Stover, (781) 377-3779.

Respectfully submitted,

THOMAS C. STOVER

Attorney for Applicant

Registration No 22,531

Marked-up version of claims to show changes made to above clean version.

Amend the following claim:

1. (Twice Amended) A rocket plume detector [through clouds] comprising,

a) a passive electro-optical sensor for detecting narrow band spectral emissions in a rocket engine plume, including through clouds; and

b) a lock-in amplifier to reduce background radiation for enhanced plume detection, said sensor being mounted on an above-flying or orbiting platform.

Exhibit A